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Weekly Bulletin

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Vol. II, No. 2 FEBRUARY 24, 1923 GUY P. JONES EDITOR

VENTILATION OF HOMES.

There is an old bugaboo concerning ventilation that needs, in the light of present-day knowledge, to be utterly banished. This is the old idea that the ill effects from improperly ventilated rooms are due to the presence of excessive carbonic acid gas or to insufficient oxygen.

Dr. Chas. J. Hastings, Medical Officer of Health, of Toronto, states that "ordinary air contains about 20 per cent of oxygen and 3/100 of 1 per cent of carbon-dioxide or carbonic acid gas. It has been shown, however, that an atmosphere containing only 15 per cent of oxygen and as much as 2 to 4 per cent of carbon-dioxide or carbonic acid gas may be endured for a length of time without harm. These proportions represent vitiation much beyond anything possible in the ordinary human habitation. Carbon-dioxide, in itself, is well known to be harmless. For instance in the process of brewing, and this is looking into the past, large quantities of carbonic acid gas are present, the air of the brewery containing from 1.5 to 2.5 per cent all the time, and even as high as 6 per cent at times, and men work in this for years without any ill effects."

It has been proven that expired air contains no poisonous substances, beyond, possibly, the bacteria of diseases that may be contained in the droplets from expired breath, but not in the air itself.

Failure to prove that physical discomfort through faulty ventilation is due to the increase of carbonic acid gas or to diminution of oxygen, or the presence of organic poisons in expired air, has led to investigations into the physical changes, such as the increase of humidity and increase in temperature, and the stillness of the air in a poorly ventilated room. Concerning these investigations, Dr. Hastings says:

"Healthy individuals have been placed in cabinets of three metres cubic capacity for periods up to four hours. After a time symptoms of headache, dizziness and depression were observed. Those in the cabinet were then allowed to breathe the fresh outside air through a tube, but this gave no relief, nor did the air of the cabinet produce any symptoms when breathed through a tube by a person outside, but the discomfort of those in the cabinet could be almost instantly relieved by the following procedures: First—drying the air in the cabinet to a normal degree of humidity. Second—the cooling of it to a temperature consistent with health and physical fitness. Third—stirring it up by means of a fan.

None of these procedures, mark you, involved any chemical change in the air.

The explanation underlying the foregoing observations is as follows: Normally, a certain heat interchange occurs between the human body and the air surrounding it. In order that this interchange may take place with the greatest facility, the air must first be in motion, so that the atmosphere surrounding the body is changed as fast as it is heated. Second—it must be cooler than the body itself, so that the heat may be lost from the body by radiation, and third—it must be relatively dry, so that the evaporation of the body moisture, that is the perspiration, may help to keep down the temperature of the body.

It must be apparent to our readers that vitiated atmosphere of densely crowded, poorly ventilated public halls and rooms fails to provide any one of these conditions. What is found in these circumstances is the temperature abnormally high, the humidity excessive, and little air movement.

Modern Conception of Proper Ventilation.

While this conception of the principles upon which modern, efficient ventilation is based has been familiar to many of us for years, unfortunately there is a certain proportion of our people who have adhered to the old idea of the percentage of carbonic acid gas affording a guide for efficient ventilation.

In order to demonstrate the foregoing facts in regard to the modern conception of ventilation, the Medical Research Council of Great Britain established a Department of Applied Physiology under the direction of Dr. Leonard Hill, who has so successfully applied laboratory experiments and results to problems connected with industries, public health and disease. In his report to the Medical Research Council on the Science of Ventilation and Open Air Treatment, a subject which he has long made his own, Dr. Hill combines the result of his experimental work with a review of the existing knowledge and thus provides in an accessible form the scientific basis for the practice of ventilation and open air treatment. The ground covered and the store of information, sometimes drawn from unexpected sources, are intensely interesting. "Successful ventilation" is described as "dependent on the prevention of stagnation of the body heat on the one hand, and of uncomfortable chilling of the body on the other."

As Dr. Leonard Hill points out, the widespread explanation in the past as regards discomfort and impaired health from crowded and ill-ventilated rooms, and apartments, is erroneous. It is not the excess of carbonic acid gas, or lack of oxygen, or the presence of organic impurities in the expired air. The real cause is not chemical, but physical.

The virtue of the open air treatment is the result of the heat produced by the sun and the cooling and evaporating influences of the outside air in motion. This efficient regulation of the body heat by the evaporation process, and the current of air experienced outdoors, rapidly changing the volume of air surrounding the body, increases absorption and elimination, and also stimulates digestion. "The open air treatment of tuberculosis," Dr. Leonard Hill goes on to say, "should be based on physiological principles and not on the blind belief in the virtues of fresh air alone." And in conclusion he says, "The old carbonic acid gas idea as a gauge for atmospheric purity is a thing of the past, and together with organic impurities so frequently referred to, mav be placed in the museum of archaic ideas."

The foregoing explanation of the cardinal points necessary to observe in order to secure proper ventilation, expresses the consensus of opinion of all administrators of public health, of all sanitary engineers, both in Great Britain and on this continent. Having carefully perused the reports and the conclusions arrived at by the Medical Research Council of Great Britain through Dr. Sir Leonard Hill in England, and the most valuable research work done by Professor C. E. A. Winslow of Yale University and his colleagues on this continent, we are forced to conclude that the evidence is all in, the case is closed, the last word has practically been said. There is no longer room for any second opinion as regards the fundamental principles of ventilation.

It is fitting that at the present time we should all be familiar with the conditions essential for efficient heating and ventilation, more especially in view of the fact that the modern conception of the ways and means of securing efficient air conditions is somewhat more economical than those practiced in the past. It must be apparent from the foregoing fact that it is not necessary for us to have wide open windows in the winter time, but just sufficient opening to insure a current of air of sufficient volume to bring about more or less constant change of air surrounding our bodies, thereby enabling us to eliminate the necessary amount of heat in order to prevent any of the symptoms which arise as a result of being enveloped in stagnant air.

It is important that we familiarize ourselves with the most economical way to efficiently heat our homes. While we have been speaking of excessive humidity in overcrowded public halls, we find the very opposite to this in the rooms of the average home, where they are heated by hot air or hot water. In these cases, we find a lamentable absence of humidity, in as much as the air coming in from outside with say 65 to 75 per cent of humidity, that is normal, will, before it reaches the individual in the room, be reduced to probably 40 to 45 per cent. This is not sufficient, and causes such excessive evaporation from our bodies as to require us to raise the temperature of the room to probably 70 degrees or more, whereas, with proper humidity, we would experience the same comfort in a temperature of 65 degrees. Therefore, it is necessary for us to see to it that normal humidity, that is 65 per cent, is maintained. You can maintain a reasonable degree of humidity by keeping the water reservoir in your hot air furnace full of water all the time. A very satisfactory way of securing a reasonable amount of humidity for a living room, and at the same time answering the purpose of a decoration of a most desirable character, is the placing of flowering plants and ferns in the windows, each of which, if kept well watered, will give off, by evaporation, a pint of water a day. Small vessels with the largest possible amount of surface, containing water, should be exposed in different parts of the house. If a coal range is in use, there should be a vessel containing boiling water on the range at all times, which will aid in throwing off steam.

Summary.

First—The three conditions essential for efficient ventilation are temperature, humidity and current or movement.

Second—The air of a room, even if well filled with people, never contains sufficient carbonic acid gas to be injurious to the health of those occupying it, nor yet is the amount of oxygen ever sufficiently reduced to endanger health, providing that the aforesaid air is kept at a proper temperature, that is from 65 to 68 degrees, and a proper humidity, that is 65 per cent, and kept in motion.

Third—The air of overcrowded public halls becomes overcharged with humidity through elimination from the skin and the breath of those in the room, and consequently should be frequently changed, either by cross ventilation or by exhaust fans.

Fourth—The air in the average dwelling in the winter time is too dry, and too hot, and at times stagnant. However, we can counteract this latter objection in a degree at least by moving around during the day time from one room to another, and therefore, our bodies are not for any great length of time enveloped in the same volume of air. It must be apparent, however, that at night when we are in our beds, and are occupying relatively the same volume of air for hours, that the necessity for a current or air movement becomes imperative.

Fifth—The real danger to health, of the air conditions in an overcrowded public hall or public conveyance, is through the droplets that are ofttimes thrown off in coughing or sneezing, or forcefully talking, which may contain the germs of disease from a chronic carrier or one just convalescing from some communicable disease.

The Bridge of Life.

The bridge thou seest, said he, is HUMAN LIFE; consider it attentively. Upon a more leisurely survey of it, I found that it consisted of three-score and ten entire arches, with several broken arches, which, added to those that were entire made up the number to about an hundred. As I was counting the arches, the Genius told me that this bridge consisted at first of a thousand arches; but that a great flood swept away the rest, and left the bridge in the ruinous condition I now beheld it. But tell me further, said he, what thou discoverest on it. I see multitudes of people passing over it, said I, and a black cloud hanging on each end of it. As I looked more attentively, I saw several of the passengers dropping through the bridge into the great tide that flowed beneath it; and upon further examination perceived that there were innumerable trap-doors that lay concealed in the bridge which the passengers no sooner trod upon, but they fell through them into the tide, and immediately disappeared. These hidden pitfalls were set very thick at the entrance of the bridge, so that throngs of people no sooner break through the cloud but many of them fell into them. They grew thinner towards the middle, but multiplied and laid closer together towards the end of the arches that were entire. There were, indeed, persons, but their number was very small, that continued a kind of hobbling march of the broken arches, but fell through one after another, being quite tired and spent with so long a walk.

—From Addison's "Vision of Mirza."

Another Death from Rabies.

A five-year-old Japanese child died a few days ago in Los Angeles, and it was not until after death had occurred that it was learned that the child died of rabies. A Japanese physician attended the case and made the diagnosis, which was confirmed later. Through a delay in reporting the case, no information was available until the death certificate was filed.

It was learned that the child was bitten on the heel by a dog, six or eight weeks before death occurred. Symptoms of rabies developed five days before death.

MORBIDITY.*

Smallpox.

Eleven cases of small pox have been reported, the distribution being as follows: Los Angeles 3, Modesto 3, Oakland 3, Stanislaus County 1, Ventura 1.

Typhoid Fever.

Four cases of typhoid fever have been reported, one each from the following localities: Orange County, Redlands, Sacramento County and Sacramento City.

Cerebrospinal Meningitis.

Eureka and Los Angeles each reported one case of cerebrospinal meningitis.

Leprosy.

San Francisco reported one case of leprosy.

Epidemic Encephalitis.

San Francisco reported one case of epidemic encephalitis.

Rabies.

Los Angeles reported one case of rabies.

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*From reports received to date for last week.

COMMUNICABLE DISEASE REPORTS.

Disease	1923				1922			
	Week ending			Reports for week ending Feb. 17 received by Feb. 20	Week ending			Reports for week ending Feb. 18 received by Feb. 21
	Jan. 27	Feb. 3	Feb. 10		Jan. 28	Feb. 4	Feb. 11	
Anthrax	0	0	0	0	0	0	0	0
Cerebrospinal Meningitis	1	6	1	2	1	8	7	3
Chickenpox	150	138	189	175	122	107	168	180
Diphtheria	206	183	171	139	297	248	216	165
Dysentery (Bacillary)	2	1	1	1	1	0	0	0
Epidemic Encephalitis	9	2	3	1	1	6	1	1
Gonorrhoea	113	102	202	65	70	118	100	32
Influenza	185	184	661	821	68	119	1,013	4,315
Leprosy	1	0	1	1	0	0	0	0
Malaria	1	3	2	1	1	2	3	3
Measles	247	255	322	269	14	14	20	22
Mumps	18	18	11	21	99	75	120	92
Pneumonia	141	144	198	182	100	139	196	182
Poliomyelitis	2	1	1	0	4	0	0	0
Rabies	0	1	0	1	0	0	0	0
Scarlet Fever	151	152	193	173	146	180	144	114
Smallpox	10	15	21	11	122	102	92	88
Syphilis	134	120	214	75	101	65	137	32
Tuberculosis	149	185	188	122	145	147	155	123
Typhoid Fever	11	9	12	4	12	11	7	5
Whooping Cough	88	103	130	84	57	51	61	42
Totals	1,619	1,622	2,521	2,149	1,361	1,392	2,440	5,399

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